

At a Glance

Analysis of SAT Scores: Part II
January 2012

The following analysis is the second in a two-part series examining in greater detail the 2011 mean SAT scores of students in South Carolina. While the first analysis focused on mean SAT scores of the state and of school districts, the following focuses on mean SAT scores for individual high schools in South Carolina. Because research has shown that students who take more rigorous and advanced courses in high school achieve higher SAT scores, the analysis will also examine Advanced Placement (AP) scores in high schools as well. All data files were available on the website of the South Carolina Department of Education or provided directly to the EOC by the South Carolina Department of Education.

First, it is useful to look at SAT gains as a function of changes in the number of students taking the exam. As the base, the number of SAT test takers increase, history predicts that more “less qualified” or “less prepared” students will take the SAT. Consequently, the mean or average SAT scores would decline. Conversely, it makes sense to look at those specific schools where SAT performance increased and ask the question “did fewer students take the SAT?”

Looking at student performance on SAT mathematics in 2011 in South Carolina, there were 64 schools that had an increase in mean math SAT scores from 2010 to 2011. How did the population of test takers change in these 64 schools? We would presume that – assuming no change in the characteristics of the school population or the two years – there would tend to be fewer test takers in these schools in 2011. The data show that for 14 of these 64 schools (about 22 percent) did have a decrease in the number of test takers of at least 5 percent, thus supporting the position outlined above. However, at the same time, in 22 of the 64 high schools (about 34 percent) there was an increase of 5 percent or more in the number of test takers. Therefore, there was a larger percentage of schools that were counterexamples. Furthermore, a majority of these schools, 28 (about 44 percent) had SAT mean increases but about the same number of test takers in 2011 as in 2010.

So “expected results” were not found for SAT math; what can be said regarding the other SAT subjects? To answer this question Table 1 is provided. The column headed Math includes the information presented above, and data for the other SAT tests (and the reading/math hybrid) are presented in the other columns. Of note is that fact that for any SAT subject, the largest percent in the “Fewer” row is in Writing where about 25% of the schools showing a mean gain had fewer test takers. Taken another way, this means that in the worst case, three-fourths of the schools with a mean increase did so with about the same or more students taking the test. The final row in the table requires an explanation. The “Absolutely more” figure caters to anyone who says that “any increase is an increase”

Table 1
High schools with increased mean SAT scores by subject
And by changes in number tested

Change in number tested	Math	Reading	Writing	Reading/Math Combination
Fewer	14 (21.9%)	20 (22.5%)	21 (24.7%)	18 (22.4%)
About the same	28 (43.8%)	38 (42.7%)	39 (45.9%)	35 (43.8%)
More	22 (34.3%)	31 (34.8%)	25 (29.4%)	27 (33.8%)
Total	64 (100%)	89 (100%)	85 (100%)	80 (100%)
Absolutely more	39 (60.9%)	45 (50.6%)	43 (50.6%)	42 (52.5%)

Note: “Fewer” means a decrease of at least 5% tested; “About the same” means between 5% fewer and 5% more tested; “More” means an increase of at least 5% tested; and “Absolutely more” means any increase in percent tested.

Overall, there were 201 high schools with a sufficient number of test takers in 2010 and in 2011. Of these 201 high schools, 64 (or 31.5 percent) had an increase in the mean SAT score for mathematics from 2010 to 2011. There were 89 (or 44.3 percent) with an increase in the mean SAT score for reading over the same time period. And, 85 schools or (42.3 percent) had in increase in the mean SAT score for writing. Finally, there were 80 high schools or (39.8 percent) that had an increase in the combined reading and math mean scores.

Considering only those high schools that had an increase of at least five percent in the total number of test takers, approximately one-third of the above schools showed increases in the mean SAT scores and increases in the number of test takers of at least five percent. Many contend that an “increase is an increase.” Consequently, Table 2 below aggregates the data for all high schools that had any increase in the number of test takers and an increase in the mean SAT scores. The data confirm that increases in the mean SAT scores from 2010 to 2011 are not in general due to a decline in the number of test-takers.

Table 2
Number of High Schools with Increase in Mean SAT Scores Across Subject Areas
and with Absolute Increase in Number Tested
(2010 to 2011)

	Mathematics	Reading	Writing	Mathematics and Reading
	39	45	43	42
% of All	60.9%	50.6%	50.6%	52.5%

The analysis then looked at the individual schools that showed an increase on at least one of the three SAT subject tests. In the following analysis we will not examine the reading/mathematics combination. There were 116 different high schools in this group and when restricted to those with a non-trivial increase in the number tested (5% or more test takers in 2011 as compared to 2010, hereafter referred to as “more”), the number is reduced to 39. Tables 3 and 4 below display some of the details of these 39 schools. Table 3 contains those 11 schools which had an increase in each of the three tests whereas Table 4 lists the other 28 school.

Table 3
Information on 11 High Schools with Gains on all Three SAT Tests and Had 5% or more Increase in Number of Test Takers

School	District	No. Test Takers (2011)	Poverty Index	Mean Increase In:		
				Math	Reading	Writing
Burke	Charleston	61	95.63	1	19	15
Military Magnet Academy	Charleston	37	92.42	15	3	29
Carolina	Greenville	31	89.94	4	58	40
Woodmont	Greenville	160	60.05	8	13	13
Brashier Middle College Charter	Greenville	57	18.86	7	22	6
Wade Hampton	Hampton 1	61	74.55	14	3	9
Spring Valley	Richland 2	300	47.73	3	2	6
Ridge View	Richland 2	292	43.35	3	8	1
James F. Byrnes	Spartanburg 5	257	55.36	3	15	12
Union County	Union	136	72.60	25	16	10
Nation Ford	York 4	229	28.92	10	16	5

As the information above notes, many of these schools are in districts with large student enrollments. Many of these schools have special magnet programs including the International Baccalaureate program. And, while not all of the above schools had a cumulative SAT score above the state average, these schools did have increases in all three subject areas as well as a more test takers in 2011.

The remaining 28 schools showed gains on at least one of the SAT tests and had more test takers in 2011. Table 4 notes, there were some significant gains and losses in the mean SAT scores in math, reading and writing in these schools.

Table 4
Information on 28 Schools with Gains on at least One SAT Subject Test and Had 5% or more Increase in Number of Test Takers

School	District	No. Test Takers 2011	Poverty Index	Mean Change In:		
				Math	Reading	Writing
Pendleton	Anderson 4	58	56.96	6	-10	-4
Westside	Anderson 5	126	71.32	9	7	0
Blackville-Hilda	Barnwell 19	22	90.35	-12	45	3
Bluffton	Beaufort	226	49.77	-5	0	3
James Island Charter	Charleston	226	47.22	6	4	-13
Lewisville	Chester	43	58.82	7	-22	-9
Central	Chesterfield	42	75.93	-7	2	-8
Mayo	Darlington	52	46.02	12	16	-6
Lake view	Dillon 1	33	78.06	23	5	0
West Florence	Florence 1	260	53.93	-12	3	2
Timmons ville	Florence 4	37	91.90	-4	-25	20
Georgetown	Georgetown	97	72.69	6	-1	13
Eastside	Greenville	203	39.36	-4	7	-6
Greenville	Greenville	208	63.04	4	-1	0

Travelers Rest	Greenville	150	61.28	-12	3	-12
Emerald	Greenwood 50	103	62.81	-9	4	-8
Saint James	Horry	176	55.75	-5	15	15
Indian Land	Lancaster	88	36.53	7	2	0
Clinton	Laurens 56	109	76.50	3	7	0
Mid Carolina	Newberry	76	53.92	0	6	9
Walhalla	Oconee	89	55.82	-11	14	1
Branchville	Orangeburg 4	32	71.02	-2	30	15
Richland One Middle College	Richland 1	24	78.87	-4	37	22
Spartanburg	Spartanburg 7	260	71.62	-5	1	0
Kingstree	Williamsburg	101	95.53	9	-13	6
C E Murray	Williamsburg	43	94.41	-2	7	14
SC Connection Charter	SC Public Charter School District	33	64.70	-16	-26	5
Palmetto State E-Cademy Charter	SC Public Charter School District	22	65.06	-9	1	7

Advanced Placement (AP)

Table 5 is presented to aid in determining whether there was more activity in Advanced Placement in 2010-11 than in the previous school year. As can be seen, there were more test takers (18,689 vs. 17,548), and more tests taken (30,769 vs. 28,498). In fact, all of the changes from 2009-10 to 2010-11 were positive, allowing us to refer to the changes as “increases.” Of particular importance is the fact that this increase in the number of test takers and tests taken did not lead to poorer performance. On the contrary, the increase in the number of tests passed (1,690) represents an increase in percent passed from 55.1% to 56.5%. Although the “Min & max” columns in the table may be confusing, they are presented to point out the fact of the severe skewness manifest for the “counting” variables when expressed at the school level. This is due to the differences in sizes of the high schools in the state. The variable “tests taken per school”, for example, ranged from 4 to 1,088 in 2009-10 and from 2 to 1,135 in 2010-11.

Table 5
Advanced Placement results for 168 High Schools
With data for 2009-10 and 2010-11

	2009-10		2010-11		Increase
	Mean	Min& max	Mean	Min & max	
Test takers	17,548		18,689		1,141
Total tests taken	28,498		30,769		2271
Test takers per school	105a	4 & 548	111a	1 & 521	6
Tests taken per school	169a	4 & 1,088	183a	2 & 1,135	14
Tests taken per student	1.62		1.65		0.03
Total tests passed	15,706		17,396		1690
Percent tests passed	55.1		56.5		1.4

a-rounded to nearest unit (one)

In an overall sense there was more AP activity in South Carolina in 2010-11 than in 2009-10, it would be instructive to look at individual high schools and see if the overall conclusions arrived at above apply to all schools. For this purpose, percent change was seen to be more appropriate than absolute change (in number) of test takers. This decision was based in part on the extreme variation in numbers associated with the great disparity in school size. For example the maximum and minimum values of change in test takers were as follows: maximum, 214 more test takers; minimum, 82 fewer test takers.

At this stage the investigation focused on only high schools with an increase in test takers. Seventy (70) of the 168 schools did not have an increase limiting our study to the remaining 98 high schools that did. Of particular note are these facts: there were over 1,100 more students taking AP tests in the recent year, almost 2,300 more

tests taken, and there were almost 1,700 more AP tests that were passed. Although the increase in passing rate was not great—55.1% to 56.5%--that it was an increase is very encouraging given the increase in the number of test takers. The mean percent increase for the 98 schools was 37.3% but this figure is not representative due to the severely skewed nature of the distribution. For example, three schools had changes of 300 percent or more; they were Hillcrest High, Barnwell High, and Hardeeville High. The median value for percent increase in test takers was 21.0. Using the criterion that the increase in test takers must be at least 5% to be considered substantive, the number of schools is reduced from 98 to 83. Of these 83 schools, 43 had higher passing rates in 2010-11 than in the prior year. The names of these schools, their districts and the percent increase in AP tests passed are presented — in order of the increase — in Table 6.

Table 6
43 Schools with More than 5% Increase in AP Test Takers and Positive Change in AP Tests Passed, 2009-10 to 2010-11
(Sorted by Increasing Percentage Passed)

School	District	% Increase in AP Tests Passed
Ashley Ridge	Dorchester 2	0.5
Cross	Berkeley	0.8
Emerald	Greenwood 50	0.8
Woodmont	Greenville	1.5
Greenville Tech Charter	Greenville	1.6
North	Orangeburg 5	1.6
Creek Bridge	Marion 7	1.8
Orangeburg Wilkinson	Orangeburg 5	1.8
Berkeley Count Middle College	Berkeley	1.9
South Florence	Florence 1	1.9
Clinton	Laurens 56	2.3
Green Sea-Floyds	Horry	2.4
Burke	Charleston	2.4
Aiken	Aiken	3.8
Pickens	Pickens	3.8
McCormick	McCormick	4.2
Walhalla	Oconee	4.6
Mid Carolina	Newberry	5.3
North Myrtle Beach	Horry	6.0
R B Stall	Charleston	6.0
Bethune-Bowman	Orangeburg 5	6.3
Cane Bay	Berkeley	6.4
Saint James	Horry	6.4
Fairfield Central	Fairfield	6.9
South Aiken	Aiken	8.7
Liberty	Pickens	8.9
Lee Central	Lee	9.1
Westside	Anderson 5	10.0
James Island Charter	Charleston	11.1
James L Mann	Greenville	12.5
Barnwell	Barnwell 45	12.5
Camden	Kershaw	12.6
Stratford	Berkeley	13.0
Goose Creek	Berkeley	13.8
Southside	Greenville	14.8
Central High	Chesterfield	15.4
Bluffton	Beaufort	16.7
Allendale-Fairfax	Allendale	17.1
Marlboro	Marlboro	18.3
Bamberg-Ehrhardt	Bamberg 1	20.4
T L Hannah	Anderson 5	31.3
Berea	Greenville	43.8
Mauldin	Greenville	80.0

Comparing the schools listed on Table 6 with those in Tables 3 and 4, there were 11 schools that had increases in AP passage rates and increases in mean SAT scores. These schools are noted in Table 7. Additional examination of the mean SAT scores of these schools compared to the mean SAT score in the state and nation as well as additional analysis of AP passage rates in these schools would reveal more information on student academic achievement and strategies employed at these schools. For example, did students participate in SAT-preparation programs? Did AP teachers participate in AP professional institutes in the summer?

Table 7
11 Schools with Increases in SAT Scores and AP Tests Passed

School	District	Number SAT Subject Areas with Increase Mean Score	% Increase in AP Tests Passed
Westside	Anderson 5	2 of 3	10.0
Bluffton	Beaufort	1 of 3	16.7
Burke	Charleston	3 of 3	2.4
James Island Charter	Charleston	2 of 3	11.1
Central	Chesterfield	1 of 3	15.4
Woodmont	Greenville	3 of 3	1.5
Emerald	Greenwood 50	1 of 3	0.8
Saint James	Horry	2 of 3	6.4
Clinton	Laurens 56	2 of 3	2.3
Mid Carolina	Newberry	2 of 3	5.3
Walhalla	Oconee	2 of 3	4.6